v. 14 #2

The MONTHLY REVIEW

Published Monthly by the

American Electroplaters Society

A SOCIETY FOR THE ADVANCEMENT

OF THE

SCIENCE OF ELECTROPLATING

FEBRUARY, 1927

Entered as second-class matter, September 3, 1926, at the Post Office of Chicago, Ill., under act of August 24, 1912.

Acceptance for mailing at special rate of postage, provided for in section 1103, Act of February 28, 1925, authorized September 3, 1926.

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HEY, HEY, FELLERS!

Whatcha Doing About Going to the Toledo Convention, June, 1927? Won't Be Long Now

MONTHLY REVIEW

Published by the

American Electroplaters Society

Publication and Editorial Office
3040 Diversey Ave., Chicago

VOL. XIV FEBRUARY, 1927 No. 2

EDITORIAL

After reading the November and January issues of our Monthly Review, I would feel remiss in my duty to the Society, as a Past President and Associate Editor, if I did not comment upon the many suggestions of our research and publishing committees.

The report of the efforts and the results of the recent Research Fund Campaign, and the contemplated action of the Bureau of Standards, in conjunction with our Research Committee, is commendable; but the support of the committee by our membership is to be deplored, and I feel that while this effort upon the part of the American Electroplaters Society may be putting their star of destiny to a severe test, we as members of this great institution of progressive electroplating industry should at least give our support to efforts of these committees whole heartedly, that the world may know these unselfish workers are not laborers in a barren vineyard, but are the direct representatives of the most progressive body of foreman executive electroplaters in the world.

Summarizing: We have never failed in anything that was for progress, education, and good of our craft. Are we members willing to back slide, the greatest progress we have known, by neglecting to even answer the research post cards sent to each of us, and also neglect to give material for publishing committee's needs, to give us the best publication on our craft known. Let's awaken from our holiday depression and assume our responsibilities and turn our minds and exuberance into work that these committees may succeed, that we may be successful.

O. E. SERVIS,
Associate Editor.

A NEW RUST PROOF BLACK FINISH FOR IRON AND STEEL

By Charles H. Proctor

The slogan of a nationally known paint manufacturer "protect the surface and you protect all," is truly applicable to the metal fabricating industry whose product must of necessity be exposed to atmospheric influences, which produce corrosion and the resulting rust—the great destroyer of ferrous metal.

We have been advised by metallurgists and investigators of atmospheric corrosion of iron and steel, that if it were possible to produce an absolutely pure iron, its surface would not rust. They cite as an example an iron pillar located near one of the great gates of the City of Delhi, India, that has stood for 1600 years, exposed to the ravages of atmospheric influence and destruction and still stands as a remarkable example of the rust resisting qualities of pure iron. We can wander over the civilized world and find examples of architectural iron fabricated hundreds of years ago by master blacksmiths at the village forges that have resisted the action of atmospheric influence for generations. What is the reason? Is it possible that in those long years ago, the workers in iron, for steel was unknown, did produce a better iron or incorporate some factors that did produce a better iron? It is not for me to discuss this phase of the subject. Metallurgists and research chemists still have a world field in which to exploit their ideas. My work is to produce commercial results, as the plater states when theory is discussed; he remarks theory is splendid, but I must produce the goods. We all know the ravages of rust when we consider for a moment that five million tons of coal, our greatest natural asset, were used in 1916 and at this date possibly more, in making one million tons of steel to replace that which was lost by rust. The importance of the saving of these products and the labor entering into them can be readily appreciated. One railroad alone reported several years ago a daily loss covering its entire system of eighteen tons per day of metal due to corrosion.

There must come a day when more attention must be paid to the protection of iron and steel from atmospheric corrosion and the resultant rust, the great destroyer, if future ages are to enjoy and benefit from the wonderful metals, iron and

steel, we so lightly cast aside. Nature has been bountiful to America in natural resources but as a nation we are wasteful and profiligate of these natural resources. Never again in the history of man will nature's laboratory place below the surface of the earth and in the hills and mountains, the natural resources we have been blessed with throughout the world. Evolution of men and material only occur upon the surface of the earth, not down in its depths beyond the reach of the life-giving sun.

It is not for me to elaborate upon scientific truths; they are always with us but some day humanity of the future must do so to conserve the natural resources that is left from the iron age of today.

In the electroplating industry nearly every first-class plater that has made a thorough study of his art understands the methods in vogue for the deposition of metals upon iron and steel to protect the surface against corrosion and rust, and incidentally heat, and chemical applications which in a great measure protects steel and iron from rust when correctly applied to their surfaces.

Zinc and cadmium are pre-eminent as metal factors. Aluminum is used to some extent by the calorizing method; a sister method to sherardizing.

In the production of rust proof black finishes upon iron and steel by heat methods, the Bower Barff, Bradley, Bon Tempi and Gesner methods are used to a more or less extent. They are all based upon the patents of Bower and Barff, granted in 1857, and consist essentially of heating iron and steel in a closed retort to cherry red at about 1200 deg. F., then superheated steam is injected into the retort, which finally results in the formation of an adhering and penetrating coating of black magnetic oxide of iron, when the surface is finally protected with an oil such as linseed oil and dried thoroughly a rust resisting black finish results.

The Bradley, Bon Tempi and Gesner patents are essentially a modification of the Bower-Barff process, a hydrocarbon such as benzine or gasoline being injected with the steam. The patentees claimed much superior results to that obtained by the Bower and Barff method. This decision is still an open question, and debatable.

In the great hotels of American, the Bower-Barff finish

plus later modifications, is used extensively upon builders' hardware and results in a very lasting finish, unaffected by oxidation and atmospheric rust. There are only three or four nationally known builders' hardware manufacturers who produce this finish in American.

The Parker process is quite extensively used as a black rust proof finish, and without the final protective oil coating; as a basis for better rust resisting enameled surfaces applied to steel, etc. The Parker process is based upon the original patents of Coslett and Richards of England. One of the original patents of Coslett expired last year, so is now public property.

Zinc is still the great factor in the protection of steel from corrosion, rust and whether applied by the molten or electro-depositing method, it will possibly never be replaced, due to the low cost of the metal.

Cadmium, due to its much higher cost, will be used for specific purposes. Its resistance to chlorine laden atmospheres of the sea coast makes it applicable to iron and steel surfaces when the cost of the metal is not prohibitive.

Electro zinc plating is constantly increasing in volume. The automotive industries use zinc electro-plated products extensively and the zinc mercury cyanide solutions are gradually eliminating the acid zinc type of solutions, due to its greater throwing power and greater hardness of the zinc-mercury deposit which increases its resistance to friction and wear, and atmospheric corrosion.

I learned the other day in the Middle West that one of the greatest manufacturing industries in the world, whose product is found over the entire civilized world, will discard all acid zinc solutions in favor of the cyanide type this year, due to reasons heretofore stated. The firm in question has been experimenting with zinc deposits for several years in its research engineering departments, in New York and Chicago. I have developed a rust proof black finish for steel that is very simple of application. The method can be installed in any plating department that must produce rust-resisting finishes upon steel or iron. The basic idea is not new because three years ago I presented a paper at an educational session of New York Branch entitled, "The Production of Imitation Silver Deposits by the Aid of Zinc Cyanide Deposits and Antimony Oxide." This original paper, then, was the basis

for what I am pleased to term a new rust proof black finish. The details of the production of the finish are as follows:

Process for Producing a Rustproof Black Finish Upon Zinc Plated Steel Surfaces

Part No. 1—

The steel articles to be zinc plated must be clean from grease, oils, etc., and free from rust and scale. The usual procedure in cleansing steel goods for plating can and should be adhered to.

Part No. 2—

The articles should then be immediately plated in the Duozinc Cyanide solution.

Water	1 gallon
Cyanegg	4 ounces
Zinc Cyanide	4 ounces
Caustic Soda	4 ounces
Cyanobrite	⅛ ounce

E. M. F. 5 to 6 volts. Amperage 25 S. F.

Minimum Temperature 110/120° F.

Anodes Duozinc Electrolytic Spelter 2% Mercury.

Time of Plating, 10 minutes minimum.

Part No. 3—

Immediately after Duozinc plating, wash thoroughly in cold water, then immerse in the following solution for a moment:

Water	1 gallon
Caustic Soda	4 ounces
White Powdered Antimony Oxide	½ ounce

Temperature 120/140° F.

A dead black adherent coating will result, remove from the solution quickly, then wash in cold and boiling water and dry with heat.

The black coating should be protected with a thin coat of lacquer (air drying).

Black Nubelac N. L. L.—2050 B. and Nubelac Thinner N. 331 in proportion of 3 parts to 1 part lacquer is an excellent protective coating. The Nubelac products are manufactured by the Nubian Paint & Varnish Co., Chicago, Ill.

We have found that Benzole colored with Nigrosine Black (Benzole Soluble) and a small amount of a cheap furniture varnish to obtain an adherent mixture will answer the purpose. This mixture should not cost more than 40 cents per gallon.

Any cheap air drying black mixture can be used or any form of black lacquer commercially advertised.

If a dipping process is used to give the articles the final black protective coating, then it is possible that an air blast can be used to an advantage in blowing off excess and drips.

The use of antimony solutions in the coloring of metals is nothing new. I have advocated them in one form or the other for years. Hiorns, in his splendid work entitled, "Metal Coloring and Bronzing," published in London in 1892, gives considerable detail covering bronzing and coloring of various metals with antimony chloride and hydrochloric acid and antimony sulphide, and sodium hydrate. See pages 213 and 234. In the same work a formula is mentioned on page 212, due to Botteger an authority on electro-plating and metal coloring covering sodium hydroxide, mercury and antimony chloride. "Duillo," on page 234 of Hiorns' work, mentions an antimony solution for producing a black color upon zinc which requires an oil or varnish to protect the black, or it will rub off. There exists a U. S. patent, No. 1,436,729, dated November 28, 1922, for black coatings upon zinc prepared from water 150 gallons; sodium hydroxide 76% 2 pounds, butter of antimony 1 pint. The solution must be heated to 212 deg. F. Prior art was established by Hiorns in 1892 for coloring zinc black with antimony salts and sodium hydroxide solution. Therefore, in my opinion the patent referred to is invalidated and the writer does not consider in presenting this paper that he infringes upon any existing patent.

The solution I have advocated to produce the black finish upon the zinc plated surface, acts instantly and is adherent. Tests made with steel automobile rims finished by the process and without the final coat of protective black lacquer or other medium in the testing department of one of the largest automobile rim manufacturing plants in the United States, have found that the rust-resisting qualities of a regular zinc plated steel rim, plated in the Duozine cyanide solution has been increased from the normal 48 to 60 hours salt spray test, using the regular 20 per cent salt spray test, to 120 hours or more, or an increase in resistance to corrosion and rust of more than 100 per cent. With the application of the final coating of black lacquer or similar protective coating for the black finish, the corrosion resistance would be further increased.

It is the author's opinion that the process being simple in application can be used extensively in the metal fabricating industry, when of necessity a rust proof black finish is desirable and should prove to be a valuable addition to present known methods in the electro-plating industry.

RESEARCH ON "SPOTTING OUT" AT THE BUREAU OF STANDARDS

As you all know, during the past two years the American Electroplaters Society has been engaged in collecting from manufacturers funds to be used for co-operative researches on electroplating at the Bureau of Standards. The goal is a fund of $10,000 per year for three years, based on contributions of $50 or more per year from each subscribing firm. To date about $4,000 per year has been raised, and the campaign is being continued by their Research Committee. All of the branches have learned from Mr. R. J. O'Connor, Chairman of the Research Committee, just what each member can do to help the committee.

Mr. W. P. Barrows, who has been working in the electroplating section of the Bureau, has been appointed as a Research Associate on this fund, and is just starting an investigation of the causes and prevention of "spotting out." While this difficulty is especially experienced with the so-called "oxidized" finishes on such articles as builders' hardware and lighting fixtures, which consist of iron or steel, plated with copper or brass, treated with a sulphide solution, and finally lacquered; it is also occasionally observed on silver or gold plated articles, and even on solid brass that has not been plated. The information gained will undoubtedly be useful to every plater.

In company with Dr. Blum, Mr. Barrows recently visited a number of plants, mostly in Connecticut, and received much valuable information, and samples of both satisfactory and defective products. All the manufacturers visited expressed their willingness to co-operate in this investigation.

The exact course of the researches will depend upon the information derived from the preliminary study now in progress. The indications are that numerous factors may be involved, such as porosity of the cast or rolled metal, or variations in the methods of cleaning, plating, rinsing, "oxidiz-

ing" and lacquering the articles, or in the nature of the materials used in wrapping, or in the conditions of storage, exposure or use. A considerable period will undoubtedly be required to determine the relative effects of each of these possible factors. Whenever the results warrant, progress reports will be published in the Review.

In order that this investigation may be made as comprehensive as possible, the Bureau will be glad to receive from platers or manufacturers, typical samples of spotted products, with full information regarding their origin and history.

As above indicated, this is just the beginning of the research work on these funds collected or subscribed by the Electroplaters' Society. All of you no doubt think of other objects that should be studied.

When more funds are available, additional researches on electroplating will be started at the Bureau. The progress made will depend largely on the interest and support of the electroplaters and their employers.

SILVER PLATING OF TABLEWARE

By Mr. Elmer Roy Unruh, Dayton Branch

The electro-plating with silver was the first of all the electro-metallurgical processes to be carried out on a large scale, silver plating having been carried on practically for more than 75 years.

All silver plating is conducted in cyanide solutions, not because it is impossible to deposit silver from other types of solutions, but because the metals to be plated would precipitate silver from the solution of its ordinary salts, and silver deposited from solutions of such salts as the nitrate or acetate is usually in very coarse crystals.

Silver deposited from regular cyanide baths is rather coarsely crystalline and frosted in appearance. To remedy this, carbon disulphide dissolved in sodium cyanide solution or in an old silver solution is added to the bath in small quantities to produce a bright deposit.

The fact that most of the metals are above silver in the electrochemical series and therefore tend to precipitate it from its solutions makes difficult the plating of such metals with adherent coatings of silver. The treatment required for any metal depends upon the potential of that metal in the silver

solution, which in turn depends upon the composition and silver ion concentration of the solution. It has been found that the potential of silver, and therefore the silver ion concentration, is decreased in a silver solution by the addition of free cyanide. This is the explanation for the use of a silver strike high in free cyanide content for the initial plating upon many metals. From a cyanide silver solution containing no free cyanide, iron or steel can readily deposit silver by immersion, but from solutions with much free cyanide no such deposition occurs. This is confirmed by the fact that in silver solutions containing no free cyanaide the potential of iron was found to be negative to silver (able to throw silver out of solution), while in those containing free cyanide the potential of iron is positive to silver (not able to displace it.)

It is the usual practice, especially in the east, either to silver plate direct on the metal, or immerse in a mercury dip and then silver plate. Steel articles are given a double silver strike, first in a solution containing ¼ oz./gal. of silver, ¼ oz./gal. copper and 12 oz./gal. sodium cyanide, then in a second solution containing ½ oz./gal. silver and 16 oz./gal. sodium cyanide. Brass and nickel silver articles are immersed in a mercury dip, an adherent deposit of mercury being precipitated upon the surface, and struck in a silver strike solution containing ½ oz./gal. of silver and 16 oz./gal. sodium cyanide.

It is the usual practice in the west to give brass, nickel silver and steel articles a light nickel plate, then silver strike and silver plate. This is the method we have found most satisfactory for silver plating tableware.

In the plating of tableware we have three distinct types of work or three distinct types of metals to prepare for the plating operation, each one of which requires a slightly different method of preparation.

One class consists of flatware, such as forks, spoons and similar articles made of either nickel silver or brass. The same treatment suffices for both metals, however. The articles come to the plating room direct from the buffing room and are covered with tripoli composition and buffing dirt. The articles are placed in baskets and are immersed in boiling whale oil soap solution and remain here until the tripoli and buffing dirt are removed, which usually takes from 15

to 30 minutes. The baskets are then agitated in a warm solution of a good grade of soap chips to remove all the whale oil soap solution and to brighten the articles. The baskets are then rinsed in boiling water to remove the soap solution, and the articles are ready for the plating operation. This may seem a rather lengthy operation for the removal of tripoli and buffing dirt, but it is the only satisfactory method we have found that will consistently remove the buffing dirt and tripoli and not impair the polish and lustre of the work.

After removal from the baskets, the articles are placed in plating racks and are submitted to the following plating cycle: (1) Boiling electric potash, and (2) dipped direct into 20% solution H_2SO_4, (3) rinsed in running water, (4) returned to boiling electric potash, (5) rinsed in water, and (6) dipped in 20% solution H_2SO_4. We found it advisable to use a separate acid dip for this step and not use acid dip in step (2), as a greasy scum forms on the surface of the acid due to immersion of articles covered with hot potash, (7) rinsed in water, (8) nickel plated for 5 minutes at 2-3 volts, (9) rinsed in water, (10) silver strike, and (11) silver plate.

The second class of work consists of knives made of the ordinary steel for cutlery purposes. After the knives are polished they are washed free from grease and emery in hot coal oil and dried in sawdust. The pattern is then embossed on the handles and the knives are sent direct to the plating room. The knives are covered with a slight sawdust film and some grease from the embossing operation. They are placed in baskets and agitated in a boiling potash solution for 10 minutes and then rinsed in water and placed in a small racking up tank filled with borax solution. The knives are removed from the racking up tank and as they are removed each blade is wiped with a wet rag to remove any scum left by sawdust and placed in a plating rack. When the rack is filled it is suspended in a storage tank of borax water until enough racks are ready for a complete run. This method of preparation may seem rather laborious and costly, but we have found that it pays on this class of work for each operation plates 200 dozen or more knives day after day without having a single reject. The racks of knives are now submitted to the following plating cycle: (1) Boiling electric potash, (2) rinse, (3) 20% H_2SO_4, (4) rinse, (5) boiling electric potash, (6)

rinse, (7) 20% H_2SO_4, (8) rinse, (9) nickel plate 10 minutes at 2-3 volts, (10) rinse, (11) silver strike, (12) silver plate.

The third class of work consists of knives having a stainless steel blade and a low carbon steel handle. These knives are made by welding the handle stock to the blade stock and subsequently forging, rolling and grinding. When completed this weld is an irregular line located in the bolster of the knife. It is required that the handles of the knives be plated and the blade remain unplated. If the usual plating procedure is followed the plate can be stripped off the stainless steel portion, as stainless steel does not respond to the same treatment that ordinary steel does, back to the low carbon steel handle and will expose this irregular weld, presenting an undesirable appearance, so it is desired that an adherent silver plate be placed on the small section of stainless steel in the bolster of the knife.

These knives as they come to the plating room are in the same condition as the ordinary steel knives. They are placed in baskets and agitated in the boiling potash solution for 10 minutes, then rinsed and placed in a racking up tank of borax water. They are racked up from this tank and as soon as they are racked are submitted to the following plating cycle: (1) Boiling electric potash, (2) rinse, (3) electric concentrated HCl dip, the knives being cathode, anodes being carbon, (4) rinse, (5) boiling electric potash, (6) rinse, (7) electric concentrated HCl dip, (8) rinse, (9) concentrated HCl dip, (10) rinse, (11) nickel plate 10 minutes at 2-3 volts, (12) rinse, (13) silver strike, (14) silver plate.

The composition of all solutions used in silver plating tableware is kept under control by regular chemical analyses.

The solution which charges composition most rapidly and which is the source of much defective work in silver plating is the silver strike. We have found it advisable to maintain very rigid standard conditions for striking as regards cement density and composition of solution. The composition of the strike used in our method is ¾ Troy oz./gal. silver, and 10 oz./gal. free cyanide. Strikes are analyzed for silver and free cyanide content at least weekly and usually twice a week and additions made to maintain above composition as closely as possible.

Very little trouble is experienced with the nickel solutions

as we deposit a very light nickel plate. The solutions were originally made up of 20 oz./gal. single nickel salts, 3 oz./gal. sodium chloride, 3 oz./gal. boric acid. The pH of the nickel solutions is determined weekly and maintained at 5.9 by additions of boric acid. The nickel and chloride content is determined monthly and maintained by additions of single nickel salts and nickel chloride.

Little difficulty is experienced in the operation of the silver solutions if the composition is kept in the neighborhood of 4.00-5.00 oz./gal. silver and 7-9 oz./gal. free sodium cyanide and if care is taken in the use of the carbon disulphide brightening solution. There is much discussion concerning the carbonate content of silver plating solutions. Formerly it was customary to freeze out the carbonates during the winter months, and later the use of carbonates in amounts up to 12 oz./gal. was advocated to increase the conductivity of the bath. I am of the opinion that the presence of carbonates up to 12 oz./gal. is beneficial and that the advantages gained by freezing out the silver solutions is not due to the removal of carbonates but to the removal of other inert salts. To gain further information along these lines I operated representative silver solutions for over four years and was surprised to find one morning this summer that crystals had separated out from the solution and attached themselves to the anodes and anode rods. Upon analysis I found the crystals to be sodium fenocyanide. I have not definitely determined whether they were introduced into the solution as an impurity in the sodium cyanide or whether they were formed in the solution, but I am sure that the benefits derived from freezing out silver solutions are due to the removal of sodium fenocyanide and similar inert salts, rather than due to the removal of sodium carbonates.

The alkalinity of the cleaning solutions or potashes is determined weekly and computed in terms of per cent NaoH. The alkalinity is maintained at from 4-8% sodium by dioxide by additions of one part caustic soda to two parts soda ash.

In conclusion of this article on silver plating of tableware I might say that the operations and methods I have described are those used in producing the better grades of silverware. However we also produce cheap grades and for this purpose

we have found that an automatic plating machine is very satisfactory in increasing production and reducing the amount of experienced help required.

We are using a Full Automatic Plating Conveyor, which has the following cycle:

Electric cleaner	3 minutes
Cold rinse	35 seconds
Cold rinse	10 seconds
Sulphuric acid dip	35 seconds
Cold rinse	10 seconds
Nickel plate	5 minutes
Cold rinse	2½ minutes
Silver strike	35 seconds
Silver plate	3 minutes
Standing rinse	10 seconds
Cold rinse	35 seconds
Dryer	6¾ minutes

We have also found that this cycle is satisfactory for work receiving a heavier deposit than that which can be obtained in three minutes, so we have placed a variable speed moving cathode silver plating tank in conjunction with the automatic plater so that it can be used for work receiving a heavier deposit by having an operator remove the plating rocks from the work hanger of the automatic plater as they come out of the strike, place them on the variable speed plater to get the deposit and return the rocks to the work hanger (of course not the same hanger they were removed from) of the automatic as it enters the silver solution.

ELMER ROY UNRUH,
Muncie, Ind.

One kind of Plating is East and another is West,
While the self-same sneezes blow.
It's the place of the Sales and not the gales
Which bids it where to go.

Like the Hydrogen of the Cathode, are the ways of the fates.
Many salesmen never realize this until they are stopped at the gates.

As we journey through every-day strife
In our executive Plater's life,
It's the ambition of the soul that decides the goal,
And not the coin gained with the knife.

—Editor.

ST. LOUIS BRANCH

The fourteenth annual banquet and dance of the St. Louis Branch, A. E. S., was held on January 22, at the American Annex hotel with an Educational Session in the afternoon. This was called to order by Chairman E. S. Weil, who informed the audience that the principal speaker of the day would not be with us owing to the death of his father, and asked everyone present to rise and stand with bowed heads for one minute in silent prayer. This meant a change in the program, so Mr. Weil called upon Mr. E. W. Heil of Wichita, Kansas, as the first speaker of the afternoon.

Mr. Heil, as usual, sprung a big surprise with his new plate known as white copper. He is the first man to bring this new plate before the public, giving the formula and full details as far as his experiment has gone, but said that at some later date he would write a paper on white copper to be published in the Review giving the full experiment. Small samples were plated in a Richard's Rotary Plater of this new plate and passed around for inspection and proved to be very interesting.

The next speaker called upon was Mr. C. H. Proctor.

Mr. Weil then introduced Dr. Cuno of Washington University who gave a general outline of the different branches of chemistry that was very interesting and brought out a few good laughs. The remainder of the afternoon was given to the question box, and the main issue was brass plating led by Mr. R. J. Hazucha.

Dinner was served at 6:30 p. m. in the large dining room with about 200 present. During the course of dinner we were entertained by several singers with some good songs. Mr. E. J. Musick then introduced President Harry Siemer of St. Louis Branch who bade us a hearty welcome and wished us a most enjoyable evening. Several out of town visitors were introduced and responded with words of good wishes and were pleased to be with us.

Mr. Brown took charge and led us in community singing. This made a big hit, for everyone present had to sing. Dancing consumed the balance of the evening until a late hour.

F. P. Menniges, Sec'y.

PROVIDENCE-ATTLEBORO BRANCH

The Providence-Attleboro Branch were favored by a lecture by Dr. Colin G. Fink on December 14. The regular meeting for December 16 was omitted. Dr. Fink talked on the subject: "Recent Advances in Electro Chemistry."

Dr. Fink described several types of electro-lytic refining and reduc-

tion furnaces that are being operated at Niagara Falls, by which practically 100 per cent pure metals are being produced, i. e., in the steel-alloy group, such as chromium, vanadium, molybdenum, aluminum, etc., to which he credited the wonderful success of the present-day automobile.

Dr. Fink described several methods in mining, one especially interesting was the leaching process, citing the Utah Copper Co. which practically made a hole in the top of the mountain and leached the solvent liquid down through the ore and then collected the solution saturated with copper and refining it electrolytically, producing about 99 per cent copper from the ore that runs about 1½ per cent. Dr. Fink had a large display of electroplated pieces showing what they had accomplished at the factory with which he was connected, also samples of pure chromium, aluminum.

On January 7 the regular meeting was called to order by President John Draine. The entire evening was taken up by the business on hand, due to considering the disposition of a number of delinquent members, etc.

On January 20 at the regular meeting the branch was favored by Mr. E. M. Hayden of the Stanley Co., E. Berlin, Conn., who talked on the topic, "Lacquers."

Mr. Hayden talked for over one hour on the many different grades and kinds of lacquers, giving us a fund of information on the ingredients, qualities, etc., of the various kinds of lacquers and enamels.

On January 20 Mr. Frank Drew, of the Handy & Harman Co., talked to us on "Silver and Silver Anodes," in which he described some of the reasons for the troubles we meet in using anodes and silver stock as in handling enameled goods.

John Andrews, Cor. Secy.

DETROIT BRANCH

The Detroit Branch, A. E. S., held its educational and regular business meeting Feb. 4 at the Detroit Testing Laboratory, with President J. Flanagan in the chair, and with a good attendance.

Chromium plating was the big argument for the evening. One member asked what is the true color of chromium deposit. The general opinion seemed to be that the plater was lucky if he got any deposit at all, let alone the color. All in all, it seemed to be the general opinion of the members present, that chromium plating as it stands at the present time, is not as yet practical, that is, to chromium plate anything that the plater has to deal with on a productive basis. Every article of a different shape is a problem in itself. That being the case, the plater is confronted with a serious problem, especially where he has a various amount of work to do.

The article by Mr. Hogaboom of the January Review was read to the members, about the Sizelove plan of instructing the plater. The members were so enthused over it that Messrs. Lewis, Jameson and

McCullough were appointed a committee to get a class under way. Owing to the late hour and the few members that were left, the meeting adjourned, and the platers' class subject will be taken up at the next meeting. C. Mascola, Secretary.

BRIDGEPORT BRANCH

The meeting opened at 8:15 with our president, Mr. O'Connor, presiding. The minutes of last meeting were read and approved. We were glad to hear that Mr. Karl and Mr. Moran were on the road to recovery. Speakers' committee reported that they would try and have Mr. Graham speak to us on the night of Feb. 18. His subject will be The Control of P. H. in the Nickel Bath. It was voted on that the board of managers get a new lease on our meeting rooms, but for a shorter term of years. It is nearly time that the Bridgeport Branch has its banquet, so President O'Connor has appointed a committee of three to get it started. It is composed of Mr. Oberender, chairman, Mr. Norgren and Mr. Straton. The date will possibly be April 23, 1927. The meeting adjourned at 10 o'clock.

Wm. Ehrencrona, Sec.-Treas.

NEW YORK BRANCH

The members of the New York Branch are ready to hold their 18th annual banquet, which is also known as Founder's Day, at Aldeen Club, New York City, Feb. 19, 1927. The branch expects this to be the largest and best banquet ever held by New York Branch. The committee in charge has arranged a fine program for the afternoon session which will start at 3 P. M., presided over by Mr. C. P. Proctor. Among the speakers are Dr. W. Blum of Bureau of Standards, Mr. Taylor from A. P. Mining Co., Mr. L. Graham from Hanson Van Winkle, Dr. Fink of Columbia University, and Mr. Mac Stocker, Mr. Gardner and Mr. Loeb of New York Branch.

The banquet will start at 7 P. M., after which will follow dancing. A good time is in store for everybody.

The branch meetings have been largely attended and lively lately. At our last meeting there were 42 members present. At our recent meeting Mr. Lawrence of Chicago Branch was with us.

Questions asked at meeting:

How much nickel should you deposit on a steel article to stand 15 hours salt water spray, test 2 lbs. of salt to a gallon of water?

This question could not be answered by those present. If any members of A. E. S. have any knowledge on this subject, communicate with branch secretary.

Ralph Lignon, Rec. Sec.

CHICAGO BRANCH

Regular monthly meeting of Chicago Branch was held February 12, at the Atlantic hotel. The meeting was called to order with President Jacob Hay presiding and all officers present; there was a very large attendance.

Mr. F. J. Hanlon read a report on the work being done at the Bureau of Standards and urged the members to take more action in the Fund Drive, reminding them as to the cards sent to them and their duty in seeing that we succeed in getting our employers interested in this fund to carry on this work.

President Hay called the attention of the members as to papers for the Toledo Convention.

Mr. H. A. Gilbertson, chairman of the banquet committee, read a report on the same. This was the largest banquet ever held by Chicago Branch, there being 319 present at the banquet and 175 at the educational session in the afternoon. The committee was discharged with a standing vote of thanks and were immediately re-appointed as a booster committee for the Toledo Convention.

Our fifteenth annual educational session and dinner-dance was held January 29.

The educational session was presided over by our Librarian, Mr. O. E. Servis, and the following papers were read:

Past Supreme President Walter Allen read Dr. O. P. Watt's paper on "The Throwing Power of Plating Solutions." This was owing to Dr. Watt's illness which prevented him from attending.

Mr. Cleveland Nixon's paper was read by Mr. Nixon.

Mr. F. R. Porter presented a paper on "Notes on Chromium Plating." This proved very interesting and caused a lively discussion in which some of the members took part.

Mr. Taylor of the A. P. Munning Co. spoke on the "Cost of the Plating Departments."

Mr. H. A. Gilbertson presented a paper on "The Corrosion of Silver Deposits."

Mr. Charles Proctor, who was visiting with us, also gave a short talk on "Chromium Plating and Rust-proof Black."

The attendance at the educational session was 175.

Starting at 7:00 p. m. sharp, the dinner-dance took place. This gave us five hours of continuous jollification and entertainment—to say nothing of the splendid turkey dinner which was served. When the hour of 12:00 was reached and the strains of "Home Sweet Home" was played some 319 well-fed and smiling faces started for home, tired but satisfied that they had had the time of their lives.

There were in attendance 25 per cent of the Milwaukee Branch and several ladies; also members from the following branches were present: Detroit, Grand Rapids, Indianapolis, Cleveland, New York, Bridgeport, Pittsburgh and St. Louis, plus many of our out of town members.

R. Meyers, Secy.

TOLEDO BRANCH

On Thursday, January 6, the Toledo Branch held a get-to-gether meeting and banquet at the Secor hotel. There were twenty-four members and their wives present. Mr. Chas. Proctor was the guest of honor.

The object of this gathering was to get the ladies organized for their work in the coming convention. Officers were elected and committees appointed. President Cope gave a brief outline of the work as it had been conducted in other cities where A. E. S. Conventions were held.

Mr. Proctor gave a short talk on what would be accomplished by an organized body with a will to do things.

The balance of the evening was given over to a general discussion of ways and means in which everybody had something to offer in the way of suggestions for entertaining the lady visitors. (Judging from what they have on tap so far, the visiting ladies are going to be royally entertained.

W. W. Weiker, Secy.

PITTSBURGH BRANCH

We had one of the most interesting meetings in the history of the Pittsburgh Branch Saturday evening, February 5, which was held in the Downtown Branch of the Y. M. C. A. We were surprised to have Mr. Charles H. Proctor, founder of the society with us, and believe that this is the first time that he has met with us. Some of the members had not met Mr. Proctor before and those that had were glad to see him. Mr. Proctor, in his address, covered the plating field from early history to the present time, giving advice upon new methods of handling several new solutions and his talk on "Cadmium and Chromium" were especially interesting.

Several members present presented samples of their work, and which proved that they knew something about plating, as all samples were admired, even Mr. Proctor said that they were the best that he had seen. Mr. Proctor also had samples of work that were finished in nickel, zinc, cadmium and chromium. It is hoped that he will be able to be present again at an early date.

Meetings like the above will no doubt create more than usual interest in our branch, and it is up to all our members to try and make each and every meeting more interesting.

S. E. Hedden, Secy.

PHILADELPHIA BRANCH

The regular monthly meeting of Philadelphia Branch was held Friday, February 4, with a good attendance and the president, Geo. Gehling, presiding.

Three applicants were elected to active membership and three applications were received.

Mr. Arthur B. Wells tendered his resignation, having left the plating business. Mr. Wells was a charter member of Philadelphia Branch and his resignation was accepted with regrets.

Topic for March meeting will be "Silvering Mirrors."

"Kuburizing Racks and Gold Solutions" took up the balance of the evening.

Mr. Philip Uhl, Secy.

NEWARK BRANCH

Newark's February educational meeting was held on the 4th, 31 members being present. President Geo. Onksen presided. Two members were elected and two applications were received.

Banquet Committee reported progress, and if present plans are not changed Saturday, April 20, will be the date of the banquet at Atchel-Stetters.

Philip Sievering, Treasurer of the Research Committee, made an appeal to members to send in to the secretary the return postals sent out for information regarding subscriptions in the Research Fund.

Mr. Sizelove spoke on his experience in removing the carbonates in silver solutions by freezing, and promises to incorporate his results in an article which will be published in the Review.

Mr. Smith stated that the removal of carbonates from a silver solution will prevent pitted silver deposits when it occurs on articles which are plated in a silver bath continuously for 5 or 6 hours. An exceedingly small amount of silver will be found in the precipitated carbonates.

Royal F. Clark, Secy.-Treas.

WATERBURY BRANCH

Headquarters of Waterbury Branch, A. E. S., is now located in the Garden Theatre Building, East Main street. Meeting nights have been changed from the second and fourth Friday to the second and fourth Thursday. Chemistry class meets on the first and third Tuesday. With the change in meeting place and night, and the formation of the laboratory class, renewed interest is expected to materialize in the affairs of the branch. Wm. Gray, librarian, is arranging for some interesting meetings.

A deed of interest was recorded recently in the town clerk's office, when the property of the Chemical Treatment Company was conveyed to the Chromium Corporation of America, with offices on Broadway, New York City. Information was given to the effect that the Chemical Company had consolidated with the Chromium Corporation of America, resulting in two plants of the former company, formerly located in New York City and New Jersey, being moved to Waterbury, bringing with them a considerable number of employees. L. C. Owens, treasurer of the Chromium corporation, while in the city recently, stated that the plant was now operating with two shifts and that more employees would be brought to Waterbury shortly.

W. H. Guilfork.

NEWARK BRANCH

Friday evening, January 21, was the occasion of Newark Branch's open meeting. Members from New York Branch attended in a body and brought the attendance to 58. Business routine was quickly dispensed with and President Geo. Onksen introduced the first speaker of the evening, Mr. L. Graham, who very ably spoke on "Hydrogen

Ions." With the blackboard demonstration of why they are present in our nickel solutions, how they increase, how "buffered" by boracic acid and their control, Mr. Graham made "P. H." better understood in the minds of those present. Newark and New York members who failed to attend this meeting missed a rare treat, as the P. H. control in a nickel solution is a vital factor and is recognized as such by progressive electro-platers.

Mr. A. P. Munning spoke on the various improvements which have been made within the past few years in the art of electro-deposition.

Mr. Geo. B. Hogaboom was to have addressed the meeting but was unable on account of his voice becoming too hoarse when called upon.

Messrs. MacStoker, Fischer, Sterling and Luigira of New York Branch responded with a few words of appreciation of Newark's open meeting.

Mr. Hogaboom announced that work had, on January 17, actually begun on research at the U. S. Bureau of Standards sponsored by this society. Spotting out will be the first problem taken up.

The meeting adjourned at 10:30 p. m., and refreshments were served.

Royal F. Clark, Secy.-Treas.

TORONTO BRANCH

Toronto Branch held the regular meeting at Forester's Hall, 22 College street, January 24.

Twenty-one members responded to the call to hear a discussion on "Ventilation in the Plating Room." Dr. Cunningham, M.B., and Dr. Balmer, M.B., of the Provincial Board of Hygiene for Ontario, were the speakers of the evening, with the rest of the members emphasizing their disapproval on the working conditions of a hot cyanide copper sol that did not have ventilation over the tank.

Mr. Magill gave out his experience in detail and so realistic that the members could smell the fumes all over the hall. What these fumes were the doctors were not prepared to say off hand, but promised to make a few tests in some of the plating rooms.

Two new members were elected.

Final plans were drawn up for the annual branch euchre to be held February 28, the voluntary donation of prizes was the easiest part of the program. At the close of the meeting President Barrows called for a vote of thanks for the visitors, and complimented the members for the branch progress, urging a continuance of the members' attendance which would help the A. E. S. as a whole.

Jas. S. Cairns, Secy.

RESIGNATIONS

F. C. Williams, Westfield, Mass.....Hart-Con-Valley

TRANSFERS

F. E. Thompson, from Indianapolis Branch to.....Milwaukee

Harry Green, from Providence-Attleboro Branch to.....New York

DEATHS

Albert Schultz .....Cleveland

APPLICATIONS

Branches

William Obrien, 342 Shelly St., Peoria, Ill. (Active).....Chicago
Swan W. Broman, c-o National Lock Co., Rockford, Ill. (Active)
..... Chicago
Frank Keller, 5957 Gunnison St., Chicago, Ill. (Active).....Chicago
Wm. G. Uebel, 3719 Irving Pk. Blvd., Chicago, Ill. (Active)..Chicago
Bruno P. Nimick, c/o Mfg's Plating Co., 706 Townsend St., Chicago, Ill. (Active) .....Chicago
Herbert W. Kocks, c/o Diversey Mfg. Co., 53 W. Jackson Blvd., Chicago, Ill. (Associate) .....Chicago
Louis H. O'Donnell, 37 Seview Ave., Jersey City, N. J. (Active)
..... Newark
Alfred Pritchard, Jr., 341 Hilside Ave., Newark, N. J., (Active).Newark
George W. Grumquist, 18 Ryins St., New Britain, Conn. (Active)
.....Hartford in Valley
S. Marland, Naugatuck, Conn. (Active).....Waterbury
W. J. Cavanaugh, Waterbury, Conn. (Active).....Waterbury
Geo. Thompson, 251 Meyran St., Pittsburgh, Pa. (Active)...Pittsburgh
Thos. Philip Thomas, c/o Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa. (Active).....Pittsburgh
C. D. Eastly, 707 Bailey St., Camden, N. J. (Associate)...Philadelphia
Arthur Marx, 3091 N. Agate St., Philadelphia, Pa. (Active).....
..... Philadelphia
W. J. Becker, 6605 N. Uber St., Philadelphia, Pa. (Active).Philadelphia

ELECTIONS

Branches

Martin Philips, 66 Herbert St., Toronto, Can.....Toronto
George E. Warbeck, 75 Margueretta St., Toronto, Can.....Toronto
Owan T. Towner, 1400 S. 4th Ave., Maywood, Ill.....Chicago
John W. Russ, c/o A. P. Munning Co., Matawan, N. J.....Newark
G. E. McGuire, 55 S. 20th St., East Orange, N. J.....Newark
Fred Stebbins, 399 Orange St., Springfield, Mass.....Hart-Con-Valley
Ernest Ohl, 627 Butler St., Riverside, N. J.....Philadelphia
J. J. Youngblood, 2156 N. 12th St., Philadelphia, Pa.....Philadelphia
W. H. Barnum, 50 S. 9th St., Reading, Pa.....Philadelphia
M. Jos. Musante, 4117 4th Ave., Brooklyn, N. Y.....New York
Chas. Y. Miller, 308 68th St., Brooklyn, N. Y.....New York

SUSPENDED

Leon Jorjorian .....Providence-Attleboro
Fred C. Strong .....Providence-Attleboro
Arthur Jerome .....Providence-Attleboro
Joe Russell Cleary .....Providence-Attleboro
Marianno J. Lemos .....Providence-Attleboro
E. S. Watson .....Detroit
J. Ambrose .....Detroit
Christ Haeberly .....Detroit
H. Yoerks .....Detroit

BOSTON

Regular meetings are held first Friday of each month, at 8 p. m., at the Boston Platers' Supply Co., 202 Friend St., Boston. Secretary, A. W. Garrett, 24 Juliette St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary Wm. Ehrencrona, 872 Hancock Ave., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 316 S. Clark St. Secretary, Robt. Meyers, 2432 Wilson Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, Al. Yeager, 2021 Sherwood Ave., Norwood, Ohio.

CLEVELAND

Meets nrst Saturday of each month at Hotel Winton. M. E. Zadowski, 6517 Bridge Ave.

HARTFORD-CONN. VALLEY

Meets rourth Monday in each month alternately at 266 Pearl St., Hartford, Conn., and corner Broadway and Worthington St., Springfield. Tennant Elwin, Secretary, 117 Hobart St., Meriden, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Albert Bates, Box 34, Vandalia, Ohio.

DETROIT

Meets the first Friday of each month at the Detroit Testing Laboratory, 554 Bagley Ave., Detroit. Secretary, Chas. Mascola, 2041 Beard Ave., Detroit, Mich.

GRAND RAPIDS

Meets on the second Saturday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. J. N. Hock, 1229 W. 24th St., Milwaukee, Wis.

MONTREAL

Meets last Friday of month at Office of Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p. m. Secretary-Treasurer, Royal F. Clark, P. O. Box 201, Newark, N. J.

NEW YORK

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, J. E. Sterling, 2595 45th St., Astoria, L. I.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Pldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 44 Washington St., Prov. Engineers Rooms, Providence, R. I. Secretary, J. H. Andrew, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets every third Friday of each month at the Powers Hotel. C. A. Reama, Secretary, 512 Lyell Ave., Rochester, N. Y.

ST. LOUIS

Meets first Friday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, F. P. Menniges, 4019 Molozan Ave.

TOLEDO

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 3d St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. J. C. Cairns, 10 Wiltshire Ave., Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Thursday of each month. Secretary, Wm. F. Guilfoile, Garden Theatre Bldg., East Main St., Waterbury, Conn.